TABLE 1.—*Solar radiation intensities during October, 1927*—Con.

MADISON, WIS.

Date	Sun's zenith distance: 8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon
	75th mer. time	Air mass: A. M.					P. M.				Local mean solar time
	e.	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
Oct. 3	8.18		0.97	1.12							7.57
Oct. 4	6.50		0.91				1.20				7.04
Oct. 8	5.79			1.09	1.24						6.76
Oct. 10	5.16			0.97	1.14	1.35					5.36
Oct. 14	4.57			1.09	1.29	1.54					5.56
Oct. 15	6.02			0.86	1.06						7.87
Oct. 17	4.75			1.20							4.37
Oct. 18	5.16		1.06	1.18		1.56	1.36				4.95
Oct. 19	4.95		0.92				1.14				6.50
Oct. 20	6.50				1.24		1.24				8.18
Oct. 21	4.57			1.22	1.36						4.37
Oct. 22	7.04			0.94	1.14		1.17				8.48
Oct. 24	7.57			1.01	1.16						7.87
Oct. 26	8.48			0.89	1.13		1.17				8.81
Oct. 27	8.18				1.12		1.09				10.59
Means			**0.96**	**1.05**	**1.19**	**1.48**	**1.20**				
Departures			**+0.03**	**−0.01**	**±0.00**	**+0.09**	**+0.01**				

LINCOLN, NEBR.

Oct. 3	7.87								1.04	0.90	7.29
Oct. 4	5.79						1.20	0.97	0.83	0.63	5.41
Oct. 7	6.02				1.27						5.36
Oct. 8	5.79		0.71	0.93	1.28	1.51	1.31	1.14	0.98	0.84	4.17
Oct. 9	4.57							1.18	0.98	0.89	4.75
Oct. 10	6.76	0.88	1.01	1.13	1.22	1.43					8.81
Oct. 13	3.81	1.09	1.15	1.27	1.41	1.55					3.99
Oct. 14	4.57	0.88	1.01	1.14	1.31	1.51					6.02
Oct. 15	6.27	0.87	1.00	1.12	1.25	1.40					6.76
Oct. 17	5.79		0.86	1.03	1.26		1.28	1.09	0.92	0.82	11.38
Oct. 18	4.95	0.72	0.87	1.03	1.23	1.47		1.06	0.91	0.81	5.79
Oct. 19	5.79		0.77	0.97	1.27						7.04
Oct. 20	6.50	0.71	0.75	0.97	1.23				0.96	0.86	5.56
Oct. 21	5.79		0.58	0.93	1.31		1.27	1.10	0.94	0.82	5.36
Oct. 22	6.27		0.95	1.05	1.22		1.23	1.06	0.93	0.81	5.16
Oct. 24	5.79	0.70	0.82	0.87	1.14		1.25				5.36
Oct. 26	6.76		0.92	1.04	1.23		1.18	1.00	0.87	0.77	7.57
Oct. 31	4.57		0.94		1.33						6.50
Means		**0.84**	**0.88**	**1.04**	**1.26**	**1.48**	**1.25**	**1.08**	**0.94**	**0.82**	
Departures		**−0.04**	**−0.07**	**−0.07**	**−0.02**	**−0.01**	**−0.01**	**−0.01**	**−0.01**	**−0.02**	

* Extrapolated.

TABLE 2.—*Solar and sky radiation received on a horizontal surface*

[Gram-calories per square centimeter of horizontal surface]

Week beginning	Average daily radiation: Washington	Madison	Lincoln	Chicago	New York	Twin Falls	Average daily departure from normal: Washington	Madison	Lincoln
1927	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
Oct. 1	374	175	268	195	297	454	+50	−93	−58
Oct. 8	256	242	373	165	223	440	−35	−9	+59
Oct. 15	241	317	385	228	150	410	−33	+91	+77
Oct. 22	296	264	316	221	232	286	+37	+58	+51
Deficiency since first of year on Oct. 28							−8,351	−4,032	−6,146

POSITIONS AND AREAS OF SUN SPOTS

[Communicated by Capt. C. S. Freeman, Superintendent U. S. Naval Observatory]

[Data furnished by Naval Observatory, in cooperation with Harvard, Yerkes, and Mount Wilson observatories]

Date	Eastern standard civil time	Heliographic: Longitude	Latitude	Area [1]: Spot	Group
1927	*h. m.*	°	°		
Oct. 1 (Naval Observatory)	11 46	−76.0	+16.0	62	
		−73.0	−10.0	77	
		+46.0	−18.5		247
Oct. 2 (Naval Observatory)	11 45	−71.0	+15.5	123	
		−61.5	+16.0	108	
		−59.0	−9.5	77	
		+59.0	−18.5		185

[1] Areas are corrected for foreshortening and are expressed in millionths of the Sun's visible hemisphere.

Positions and areas of sun spots—Continued

Date	Eastern standard civil time	Heliographic: Longitude	Latitude	Area: Spot	Group
1927	*h. m.*	°	°		
Oct. 3 (Harvard)	11 20	−80.0	+23.0	92	
		+48.0	+17.5	63	
		+63.5	−11.0	135	
		+70.0	−16.0		64
Oct. 3 (Mount Wilson)	15 0	−65.0	+18.0		181
		−46.0	+17.0	4	
		−43.0	−9.0	21	
		+12.0	+12.0		20
		+76.0	−18.0		145
Oct. 4 (Naval Observatory)	11 47	−82.0	−11.0		309
		−60.0	+19.0		154
		−52.0	+15.5		154
		−32.0	−10.0	37	
		+22.5	+10.0		40
Oct. 5 (Naval Observatory)	11 46	−78.0	−18.5		185
		−67.5	−11.0		185
		−49.0	+19.0		170
		−40.0	+15.5		62
		−19.0	−10.0	40	
		+19.5	+20.5		31
		+37.5	+9.5		31
Oct. 6 (Naval Observatory)	11 46	−63.5	−18.5		216
		−55.0	−11.5		231
		−37.0	+19.0		185
		−31.0	+17.5	31	
		−27.5	+15.0		77
		−6.5	−10.0	31	
		+51.5	+8.5	15	
Oct. 7 (Naval Observatory)	11 46	−69.5	+11.0	6	
		−52.0	−18.5		185
		−42.0	−11.5		123
		−22.5	+19.5		185
		−17.5	+17.5	6	
		−12.5	+16.0		62
		+8.0	−9.5	31	
		+12.0	−9.5		12
		+15.0	−9.5		22
		+62.5	+10.0		31
Oct. 8 (Yerkes)	11 31	−37.0	−18.0		200
		−24.0	−12.0		600
		−8.0	+19.0		150
Oct. 9 (Naval Observatory)	12 50	−67.0	−10.0		123
		−48.5	+18.0		31
		−25.5	−19.0		123
		−21.5	−21.0		6
		−11.0	−12.5		309
		+4.0	+19.5		185
		+9.0	+17.5		9
		+14.0	+15.5	31	
		+34.5	−10.0	22	
		+40.5	−9.5		31
		+46.0	−9.5		46
Oct. 10 (Naval Observatory)	11 46	−83.0	+21.0	247	
		−54.0	−9.5		216
		−12.0	−19.0		123
		−9.0	−20.5		15
		+2.5	−12.5		278
		+19.0	+18.0		154
		+60.5	−9.5	46	
Oct. 11 (Naval Observatory)	11 49	−71.5	+21.0	139	
		−39.5	−9.5		185
		+0.5	−20.0		139
		+15.5	−12.5		216
		+31.0	+18.0		93
		+72.0	−10.0		93
Oct. 12 (Mount Wilson)	14 0	−57.5	+20.5	120	
		−24.0	−10.0		424
		−7.5	+15.0		7
		+15.5	−20.5		113
		+31.0	−13.0		181
		+45.0	+19.0		40
Oct. 12 (Harvard)	12 10	−56.5	+22.0	166	
		−24.5	−8.0		430
		+12.5	−18.0	153	
		+30.5	−11.0		184
		+44.5	+19.0		108
Oct. 13 (Naval Observatory)	11 43	−45.5	+21.0	108	
		−20.0	−12.0		62
		−13.0	−11.0		123
		−9.0	−9.0	108	
		+26.0	−20.0		123
		+43.5	−12.5		154
		+54.0	+20.0		46
Oct. 14 (Naval Observatory)	11 44	−32.0	+21.0	93	
		−22.5	−20.0	6	
		+0.5	−11.0		93
		+5.5	−9.0	108	
		+39.5	−20.0		93
		+53.5	−12.0		46
		+62.0	−12.5	123	
		+70.5	+18.0	46	

Positions and areas of sun spots—Continued

Date	Eastern standard civil time	Heliographic		Area	
		Longitude	Latitude	Spot	Group
1927	h. m.	°	°		
Oct. 15 (Naval Observatory)	11 48	−19.0	+21.0	108	
		+11.0	−11.0		62
		+18.0	−9.0		154
		+51.0	−20.0		139
		+73.0	−13.0	77	
Oct. 16 (Naval Observatory)	11 46	−85.0	−10.5		123
		−79.0	−7.0	93	
		−5.5	+21.0	123	
		+26.0	−10.5		77
		+31.5	−9.0		108
		+65.0	−20.0		93
Oct. 17 (Naval Observatory)	14 2	−79.0	+11.0	62	
		−64.0	−10.5		139
		−63.0	−7.0	31	
		+9.5	+21.0	123	
		+41.5	−11.0		93
		+48.0	−9.0		93
		+82.0	−20.0	108	
Oct. 18 (Yerkes)	15 40	+21.0	+22.0	100	
Oct. 19 (Mount Wilson)	17 35	−76.0	−19.0	176	
		−36.0	−10.0		124
		−34.0	−7.0	20	
		+7.0	−30.0		4
		+38.0	+20.5	100	
		+78.0	−9.5	44	
Oct. 19 (Harvard)	11 35	−72.0	−17.0	172	
		−36.5	−10.0		443
		−35.5	−6.0	38	
		+35.0	+21.5	113	
		+75.5	−8.5	117	
Oct. 20 (Naval Observatory)	13 9	−65.0	−20.0	185	
		−25.0	−11.0		185
		−22.0	−8.0	31	
		+48.0	+20.0	62	
Oct. 21 (Naval Observatory)	11 44	−53.0	−19.0		216
		−15.0	−10.5		77
		−9.5	−8.0	15	
		−9.0	−11.0	62	
		+13.5	−7.0		62
		+32.5	−29.5		46
		+60.0	+20.0	108	
Oct. 22 (Naval Observatory)	11 44	−39.5	−19.0		185
		−1.0	−10.5		77
		+4.5	−11.0	31	
		+19.5	−7.5		6
		+26.5	−7.0		62
		+39.5	−4.5	93	
		+46.0	−30.0		31
		+49.0	−10.0		46
		+72.5	+20.0	108	
Oct. 23 (Naval Observatory)	13 19	−27.0	−20.0		170
		+12.0	−10.5		31
		+19.0	−11.0	62	
		+40.0	−7.5		154
		+46.0	−5.0		154
		+61.5	−10.5		123
Oct. 24 (Naval Observatory)	11 45	−83.0	+21.0	154	
		−14.0	−19.5		185
		+10.0	−18.5		31
		+25.0	−11.0		15
		+30.5	−11.0	46	
		+52.0	−7.0		185
		+60.0	−6.5	216	
		+73.5	−11.0		139
Oct. 25 (Naval Observatory)	11 45	−70.0	+21.5	93	
		−5.0	−19.5		154
		+43.0	−11.0	31	
		+66.5	−7.5		108
		+74.0	−7.0	216	
Oct. 26 (Naval Observatory)	11 45	−58.0	+22.0	46	
		+12.5	−19.5		154
		+58.0	−11.0	62	
		+79.0	−6.0	31	
Oct. 27 (Naval Observatory)	11 45	−24.5	−17.5	15	
		−11.0	+17.0	15	
		+25.5	−19.5		93
		+71.0	−11.5	62	

Positions and areas of sun spots—Continued

Date	Eastern standard civil time	Heliographic		Area	
		Longitude	Latitude	Spot	Group
1927	h. m.	°	°		
Oct. 28 (Naval Observatory)	11 49	+39.0	−19.5		62
Oct. 29 (Naval Observatory)	11 46	−82.0	+16.0	62	
		+50.5	−19.5		62
Oct. 30 (Naval Observatory)	11 45	−82.5	+18.5	93	
		−69.0	+16.0		108
		+8.5	+14.5		31
		+10.5	+10.0		46
		+14.0	−16.5		22
		+18.5	−17.5		12
		+64.0	−19.5		62
Oct. 31 (Naval Observatory)	11 48	−69.5	+18.5	139	
		−56.0	+15.5		93
		+21.5	+16.0		62
		+24.0	+10.0		46
		+30.5	−17.0		93
		+81.0	−19.5		62

PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR OCTOBER, 1927

(Data supplied by Prof. A. Wolfer, Zurich, Switzerland, October, 1927)

1	43	11	--	21	66
2	32	12	75	22	--
3	52	13	--	23	57
4	65	14	79	24	65
5	82	15	--	25	69
6	82	16	--	26	46
7	85	17	44	27	25
8	90	18	32	28	25
9	97	19	53	29	29
10	--	20	40	30	41
				31	75

Number of observations, 25; mean=58.0.

AEROLOGICAL OBSERVATIONS

By W. R. STEVENS

Free-air temperatures were above normal at all aerological stations and at practically all observed levels. The highest temperature of record for October was observed at the 750-meter level at Broken Arrow, from 2,000 to 4,000 meters at Due West, and at 1,000 meters at Royal Center. Fluctuations in temperature in the free air from day to day were unusually small for this season of the year. The characteristic nocturnal autumn and winter surface inversion of middle and high latitudes of the Temperate Zones was observed frequently enough and of sufficient magnitude to appear in the means for the month at Ellendale, while the means near the surface show practically isothermal conditions at Broken Arrow, Groesbeck, and Royal Center.

Relative humidities were mostly below, and vapor pressures were near normal.

Free-air wind resultants were about normal. Easterly winds at high levels were observed at a number of Pacific coast and Rocky Mountain stations from the 16th to the 22d. Quite often easterly winds at high altitudes are accompanied and followed by stagnant conditions at the surface. In this connection we find that the period 16th–22d was one of unusual inactivity for western portions of the United States, with temperatures considerably above the normal.